

## New Millennium Deep Space One: A Technology Demonstration Flight to an Asteroid and a Comet

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NASA's New Millennium Program will launch a series of space flights to validate the technologies required for future deep space and Earth orbiting science missions. The first flight of the New Millennium series, Deep Space One, will be launched on 1 July 1998. It will fly by asteroid 3352 McAuliffe on 26 Jan 1999 and periodic comet West-Kohoutek-Ikemura on 1 June 2000. Thirteen technologies will be validated on Deep Space One including two scientific instruments, the Miniature Integrated Camera Spectrometer (MICAS) and the Plasma Experiment for Planetary Exploration (PEPE). The flight will also validate a solar powered electric ion propulsion system, a small deep space transponder, and a Ka-band solid state power amplifier. MICAS has two visible imaging channels, an ultraviolet imaging spectrometer, and an infrared imaging spectrometer. The wavelength range that is spanned by the instrument is 0.08-0.185, 0.5-1.0 and 1.3-2.6 micron. In addition to its scientific measurements, MICAS will also provide spatial referencing support to the Deep Space One autonomous onboard navigation capability. PEPE will measure electron and ion energies with ranges from 3 eV to 30 keV and ion masses from 1-135 amu. Along with its scientific measurements PEPE will study the effect of the effluents from the ion propulsion system on the spacecraft itself as well as the space environment, thus testing the applicability of ion propulsion to future space missions. Technology validation is the principal goal of the New Millennium program. However, each New Millennium flight is expected, in addition, to return a meaningful scientific result. Therefore, NASA will select a small science team to ensure that high quality data products will be available to the community for analysis. An Announcement of Opportunity for participation by selected members of the science community in the Deep Space One mission is expected be released early in 1997.

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